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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER NUMBER
	9

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/576,681	CHIBA ET AL.	
	Examiner	Art Unit	
	Lynne R. Edmondson	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15)☒ Notice of References Cited (PTO-892)
16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
18)☐ Interview Summary (PTO-413) Paper No(s). _____.
19)☐ Notice of Informal Patent Application (PTO-152)
20)☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

1. Claims 1 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ota et al. (USPN 5477309).

Ota teaches a mark formed on a semiconductor device (col 1 line 15) to form a circuit pattern (col 5 lines 15-25) on a wafer for product management. The dot has a length of less than 6 microns (col 7 lines 7-15 and figure 1). Based on the pitch size shown in figure 1 and the width (d), the height of the dot falls between 0.7 microns (col 7 lines 22-30) and 6 microns (col 7 line 15) and the dot length is approximately 5.3 microns. Figure 1 also shows the dot as a protrusion with a recessed periphery.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Stork et al. (USPN 6110652).

Stork teaches a laser formed microdot which is raised (embossed) (col 1 lines 15-18) wherein the dots have a length of 10-20 microns (col 3 lines 13-38). However, dot sizes of 5 to 50 micron are known in the art (col 1 lines 35-42).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ota et al. (USPN 5477309) in view of Asakawa et al. (DE 19810545 A1).

Ota teaches a mark formed on a semiconductor device (col 1 line 15) to form a circuit pattern (col 5 lines 15-25) on a wafer for product management. The dot has a length of less than 6 microns (col 7 lines 7-15 and figure 1). Based on the pitch size shown in figure 1 and the width (d), the height of the dot falls between 0.7 microns (col 7 lines 22-30) and 6 microns (col 7 line 15) and the dot length is approximately 5.3 microns. Figure 1 also shows the dot as a protrusion with a recessed periphery. The wafer (1) comprises recessed areas however, there is no disclosure of marking a beveled edge of the wafer.

Asakawa teaches laser marking of the beveled edge of a wafer (abstract, lines 1-3).

It would have been obvious to one of ordinary skill in the art to mark the entire wafer including the edge of the wafer, whether beveled or flat for precise alignment of the pattern (Ota, col 1 lines 27-33) thereby reducing detection error (Ota, col 3 lines 33-36).

4. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu (JPN 11-156563) in view of Azuma et al. (USPN 4861620).

Komatsu teaches a method of forming a laser microdot by homogenizing a laser beam and forming the desired pattern through a liquid crystal mask having a pixel length between 50 and 2000 microns, which would split the incident beam and condensed through a reduction (condensing) lens to form a dot between 1 and 15 microns (abstract). However, the energy density is not disclosed.

Azuma teaches laser marking employing a pulse beam emitting 1.1 to 5 Joule/cm^2 (col 5 lines 13-25 and col 6 lines 18-41) to form small markings. The process also employs a mask and condenser lens (col 2 lines 13-25)

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ a known energy density range (1 to 5 Joule/cm2) to provide suitable energy to form the desired shape of a small but readable mark in a controlled process (Komatsu, advantage section).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

5. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over in den Baumen et al. (USPN 5676866) in view of Yamazaki et al. (USPN 5821497).

In den Baumen teaches a method of forming a mark used pulsed laser energy of 1 J/cm^2 to make a mark of 5 microns (col 9 lines 34-44 and lines 58-60) comprising the steps of homogenizing an energy distribution of the laser beam emitted (col 4 lines 12-25), forming the desired pattern by controlling a mask having a particular pixel size (col 6 lines 3-55) which corresponds to the size of the dot to be formed (50 microns) (col 9 line 45). However, the mask is not further disclosed and neither is a condensing lens disclosed.

Yamazaki teaches laser marking with a liquid crystal mask (col 10 lines 23-44) and condenser lens (col 14 lines 1-11) for clear marking with improved accuracy (col 14 lines 42-46).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ a liquid crystal mask to precisely control the position and intensity of the component beams on the surface of the workpiece (in den Baumen, col 6 lines 47-52) and to employ a condensing lens as part of the lens array to minimize energy loss (in den Baumen, col 6 lines 8-11) and thereby control the process in a simple manner without unwanted thermal side effects on the workpiece (in den Baumen, col 4 lines 20-25).

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over in den Baumen et al. (USPN 5676866) in view of Yamazaki et al. (USPN 5821497) as applied to claim 3 above, and further in view of Lappalainen et al. (USPN 5632916).

In den Baumen teaches a method of forming a mark used pulsed laser energy of 1 J/cm^2 to make a mark of 5 microns (col 9 lines 34-44 and lines 58-60) comprising the steps of homogenizing an energy distribution of the laser beam emitted (col 4 lines 12-25), forming the desired pattern by controlling a mask having a particular pixel size (col 6 lines 3-55) which corresponds to the size of the dot to be formed (50 microns) (col 9 line 45). However, the mask is not further disclosed and neither is a condensing lens disclosed.

Yamazaki teaches laser marking with a liquid crystal mask (col 10 lines 23-44) and condenser lens (col 14 lines 1-11) for clear marking with improved accuracy (col 14 lines 42-46).

However, there is no disclosure of an energy density above 1 J/cm^2.

Lappalainen teaches a laser mark formed by a laser wherein a suitable energy density is between 1 and 10 J/cm^2 (col 3 lines 64-67), preferably between 3 and 5 J/cm^2 (col 4 line 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ known energy densities to provide suitable energy to form the mark (in den Baumen, col 6 lines 8-11) in a simple and controlled without unwanted thermal side effects on the workpiece (in den Baumen, col 4 lines 20-25).

Response to Arguments

7. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chiba et al. (PGPN US 2001/0014543 A1), Truax et al. (USPN 5175774). Nakano et al. (USPN 4734558), James et al. (USPN 5463200) Tanaka (USPN 6160603), Khosropour (USPN 6162651), Shinohara et al. (USPN 5708252) and Ishiguro et al. (USPN 5260542).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne R. Edmondson whose telephone number is 703-306-5699. The examiner can normally be reached on M-F from 7-4, with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 703-308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

LRE
October 2, 2001

TOM DUNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700